

CLAIMS

What is claimed is:

1. A method for automatically reordering variables, the method
5 comprising:
as a part of compilation,
identifying a set of variables that are candidates for
reordering, wherein the candidate variables are associated with
one or more source code files that are being compiled;
10 collecting data for determining a potential layout for the
candidate variables;
as a part of linking,
determining the potential layout based, at least in part, on
the data; and
15 reordering the variables based, at least in part, on the
potential layout.
2. The method of Claim 1, wherein determining the potential layout
further comprises:
20 selecting the next variable to associate with a virtual cache line based
on more than one variable already associated with the virtual cache line; and
indicating that the selected variable is the next variable associated with
the potential layout.
- 25 3. The method of Claim 1, wherein:
the method further comprises, partitioning the candidate variables into
categories, based at least in part on the data, wherein the categories include
at least one of a small read-only category, a large read-only category, a small
writeable category, a large initialized writeable category, and a large
30 uninitialized writeable category; and
the step of determining further comprises, determining the potential
layout, at least in part, based on the categories of the candidate variables.
4. The method of Claim 1, wherein the data includes at least one of
35 variable access counts, variable affinities, variable alignment constraints,
variable classifications, and the candidate variables.
5. The method of Claim 4, wherein the variable classifications
includes at least one of variable size, initialization class, and storage class.

6. The method of Claim 1, wherein the data is stored in one or more object files associated with the one or more source code files, and wherein the method further comprises:

5 transmitting the data to a linker by transmitting the object files to the linker.

7. The method of Claim 1, wherein:
the method further comprises, summarizing, during linkage, the data
10 associated with the one or more source code files; and
the step of determining further comprises, determining the potential layout, at least in part, based on the summarized data.

8. A computer system comprising:
15 a compiler that has a variable identifier and a data collector;
a linker that has a potential layout determiner and a variable reordering component, wherein said variable reordering component is configured to automatically reorder a set of candidate variables based, at least in part, on data for determining a potential layout of the candidate variables.

20 9. The computer system of Claim 8, the computer system further comprising:
a memory unit; and
a processor coupled to the memory unit, the processor for executing a
25 method for automatically reordering variables, the method comprising:
identifying, at the variable identifier, the set of candidate variables for reordering, wherein the candidate variables are associated with one or more source code files that are being compiled;
collecting, at the data collector, data for determining a potential
30 layout for the candidate variables; and
determining, at the potential layout determiner, the potential layout based, at least in part, on the data.

10. The computer system of Claim 9, wherein determining the
35 potential layout further comprises:
selecting the next variable to associate with a virtual cache line based on more than one variable already associated with the virtual cache line; and
indicating that the selected variable is the next variable associated with the potential layout.

11. The computer system of Claim 9, wherein:

the method further comprises, partitioning the candidate variables into categories, based at least in part on the data, wherein the categories include
5 at least one of a small read-only category, a large read-only category, a small writeable category, a large initialized writeable category, and a large uninitialized writeable category; and

the step of determining further comprises, determining the potential layout, at least in part, based on the categories of the candidate variables.

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12. The computer system of Claim 9, wherein the data includes at least one of variable access counts, variable affinities, variable alignment constraints, variable classifications, and the candidate variables.

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13. The computer system of Claim 12, wherein the variable classifications includes at least one of variable size, initialization class, and storage class.

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14. The computer system of Claim 9, wherein the data is stored in one or more object files associated with the one or more source code files, and wherein the method further comprises:

transmitting the data to the linker by transmitting the object files to the linker.

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15. The computer system of Claim 9, wherein:

the method further comprises, summarizing, during linkage, the data associated with the one or more source code files; and

the step of determining further comprises, determining the potential layout, at least in part, based on the summarized data.

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16. A computer-usable medium having computer-readable program code embodied therein for causing a computer system to perform a method of automatically reordering variables, the method comprising:

as a part of compilation,

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identifying a set of variables that are candidates for reordering, wherein the candidate variables are associated with one or more source code files that are being compiled;

collecting data for determining a potential layout for the candidate variables;

as a part of linking,

determining the potential layout based, at least in part, on
the data; and

reordering the candidate variables based, at least in part,
on the potential layout.

17. The computer-usable medium of Claim 15, wherein the
computer-readable program code embodied therein causes a computer
system to perform the method, and wherein determining the potential layout
further comprises:

selecting the next variable to associate with a virtual cache line based
on more than one variable already associated with the virtual cache line; and
indicating that the selected variable is the next variable associated with
the potential layout..

18. The computer-usable medium of Claim 15, wherein:
the method further comprises, partitioning the candidate variables into
categories, based at least in part on the data, wherein the categories include
at least one of a small read-only category, a large read-only category, a small
writeable category, a large initialized writeable category, and a large
uninitialized writeable category; and

the step of determining further comprises, determining the potential
layout, at least in part, based on the categories of the candidate variables.

19. The computer-usable medium of Claim 15, wherein the data
includes at least one of variable access counts, variable affinities, variable
alignment constraints, variable classifications, and the candidate variables.

20. The computer-usable medium of Claim 19, wherein the variable
classifications includes at least one of variable size, initialization class, and
storage class.

21. The computer-usable medium of Claim 15, wherein the data is
stored in one or more object files associated with the one or more source code
files, wherein the computer-readable program code embodied therein causes
a computer system to perform the method, and wherein the method further
comprises:

transmitting the data to a linker by transmitting the object files to the
linker.

22. The computer-usable medium of Claim 15, wherein the computer-readable program code embodied therein causes a computer system to perform the method, and wherein:

5 the method further comprises, summarizing, during linkage, the data associated with the one or more source code files; and

the step of determining further comprises, determining the potential layout, at least in part, based on the summarized data.